World Applied Sciences Journal 2013 vol.23 N3, pages 315-325

Application of cell and tissue culture systems for anticancer drug screening

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Abstract

A primary reason why potential anticancer drugs fail in clinical trials is the limitations of existing in vitro screening systems. The purpose of in vitro testing is to aid in the selection of efficacious compounds from a range of candidates with variable levels of the desired properties. In vitro cell-culture tumor models are the most widely used screening systems, however, they lack the complexity of the natural microenvironment of the host organism. Clearly, an effective screening system should possess qualities and organization similar to those of a natural tumor microenvironment. In an attempt to better simulate a tumor and its microenvironment sophisticated models have been developed, such as the three-dimensional cultures. In addition to these in vitro culture methods, tissue-based testing methods have been used to screen potential anticancer drugs but these methods have limited utility. This review describes the modern in vitro models used to evaluate cytotoxic substances that inhibit the growth of tumor cells and discusses their respective advantages and disadvantages. © IDOSI Publications, 2013.

http://dx.doi.org/10.5829/idosi.wasj.2013.23.03.13064

Keywords

Cancer, Chemotherapeutics running title anti-cancer drug screening systems, Drug screening, Tumor